Chapter Twelve

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Chapter Thirteen

Glossary

13.0 GLOSSARY

Alluvial - Pertaining to, or composed of, alluvium, or deposited by a stream or running water.

Alluvium - A general term for clay, silt, and sand, gravel, or similar unconsolidated material deposited during comparatively recent geologic time by a stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope.

Analytical Model - A model that provides approximate or exact solutions to simplified forms of the differential equations for water movement and solute transport. Analytical models can generally be solved with calculators or computers.

Aquifer - A geological formation of permeable saturated material, such as rock, sand, gravel, etc., capable of yielding economically significant quantities of water to wells and springs.

Area of Influence - Area surrounding a pumping or recharging well within which the water table or potentiometric surface has been changed due to the well's pumping or recharge.

Artesian - A condition in an aquifer that causes the water level in a well to rise above the top of the aquifer. If the water level in a well rises above the ground surface, the condition is called flowing artesian.

Artesian Aquifer - An aquifer that demonstrates artesian characteristics.

Attenuation - The process of diminishing contaminant concentrations in ground water, due to filtration, biodegradation, dilution, sorption, volatilization, and other processes.

Bedrock - A general term for the rock that underlies soil or other unconsolidated material.

Best Management Practice (BMP) - A practice or combination of practices determined to be the most effective and practical means of preventing or reducing contaminations to ground water and/or surface water from nonpoint and point sources to achieve water quality goals and protect the beneficial uses of the water.

Capture Zone -The same as Zone of Contribution.

Columbia River Basalts - Includes flood type basalts that are dense, exhibit rude columnar jointing in many places, and are folded and faulted. These basalts may include some rhyolitic and andesitic rock types. Hydraulic conductivity is highly variable; the aquifer may exhibit confined and unconfined conditions (Whitehead & Parliman, October 1979).

Cone of Depression (COD) - A depression in the ground-water table or potentiometric surface that has the shape of an inverted cone and develops around a well from which water is being withdrawn. It defines (in cross-section) the area of influence of a well. Also called pumping cone and cone of drawdown (COD).

Confined Aquifer - An aquifer bounded above and below by confining units of distinctly lower permeability than the aquifer media. An aquifer in which ground water is under pressure significantly greater than atmospheric and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the aquifer itself. The confined ground water within the aquifer will generally exhibit artesian characteristics.

Confining Unit - A hydrogeologic unit of relatively impermeable material, bounding one or more aquifers. This is a general term that has replaced aquitard, aquifuge, and aquiclude and is synonymous with confining bed. A body of material of low hydraulic conductivity that is stratigraphically adjacent to one or more aquifers. It may lie above or below the aquifer.

Contaminant - Any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste or other substance which does not occur naturally in ground water or which naturally occurs at a lower concentration.

Contamination - The direct or indirect introduction into ground water of any contaminant caused in whole or in part by human activities.

Criteria, WHPA - Conceptual standards that form the basis for WHPA delineation. WHPA criteria can include distance, drawdown, time of travel, assimilative capacity, and flow boundaries.

Discharge Area - An area in which ground water is discharged to the land surface, surface water, or atmosphere. An area in which there are upward components of hydraulic head in the aquifer. Ground water is flowing toward the surface in a discharge area and may escape as a spring, a seep, stream base flow, or by evaporation and transpiration.

Drawdown - The vertical distance ground-water elevation is lowered, or the amount pressure head is reduced, due to the removal of ground water. It is reflected by the decline in potentiometric surface caused by the withdrawal of water from a hydrogeologic unit or the difference between the static water level and the surface of the cone of depression. This is the same as the lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of ground water from wells.

Eastern Snake River Plain Basalts - Includes the basalts of the Snake River Group, the associated sedimentary and pyroclastic interbeds, and the river and lake deposited sediments that were laid down around the southern, eastern, and northern margins of the basalt flows. This flow system is considered one of the most prolific in the world. (Graham & Campbell, August 1981)

Effective Porosity (n_e) - The amount of interconnected pore space through which fluids can pass, expressed as a percent of bulk volume. Part of the total porosity will be occupied by static fluid being held to the mineral surface by surface tension, so effective porosity will be less than total porosity.

Flow Model - A digital computer model that calculates a hydraulic head field for the modeling domain using numerical methods to arrive at an approximate solution to the differential equation of ground-water flow.

Fracture - A general term for any break in a rock, which includes cracks, joints and faults.

GPD - Gallons per day, a commonly used measure of the withdrawal rate of a well.

Ground Water Any water of the state which occurs beneath the surface of the earth in a saturated geologic formation of rock or soil.

Ground Water, Confined - Ground water within a confined aquifer under artesian conditions.

Ground- Water Flow - The movement of ground water through openings in sediment and rock that occurs in the zone of saturation.

Ground- Water Model - A simplified conceptual or mathematical image of a ground-water system, describing the feature essential to the purpose for which the model was

developed and including various assumptions pertinent to the system. Mathematical ground-water models can include numerical and analytical models.

Ground Water, Unconfined - Ground water under conditions where the upper surface of the zone of saturation forms a water table under atmospheric pressure.

Hydraulic Conductivity (K) - Proportionality constant relating hydraulic gradient to specific discharge, which for an isotropic medium and homogeneous fluid, equals the volume of water at the existing kinematic viscosity that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow. The rate of flow of water in gallons per day through a cross section of one square foot under a unit hydraulic gradient, at the prevailing temperature (gpd/ft^2). In the Standard International System, the units are $m^3/day/m^2$ or m/day. A coefficient of proportionality describing the rate at which water can move through a permeable medium. The density and kinematic viscosity of the water must be considered in determining hydraulic conductivity.

Hydraulic Gradient (I) - Slope of a water table or potentiometric surface. More specifically, change in static head per unit of distance in a given direction, generally the direction of the maximum rate of decrease in head. The rate of change in total head per unit of distance of flow in a given direction. The change in total head with a change in distance in a given direction. The direction is that which yields a maximum rate of decrease in head. The difference in hydraulic heads ($h_1 - h_2$), divided by the distance (L) along the flowpath. $i = (h_1 - h_2) / L$

Hydrogeologic - Those factors that deal with subsurface waters and related geologic aspects of surface waters.

Hydrogeologic Parameters - Numerical parameters that describe the hydrogeologic characteristics of an aquifer such as porosity, permeability, and transmissivity.

Hydrogeologic Unit - Any soil or rock unit or zone that because of its hydraulic properties has a distinct influence on the storage or movement of ground water.

Infiltration Rate - Rate at which soil or rock under specified conditions absorbs falling rain, melting snow, or other forms of surface water; expressed in depth of water per unit time.

Limestone - A sedimentary rock consisting chiefly of calcium carbonate, primarily in the form of the mineral calcite.

Maximum Contaminant Level (MCL) - Maximum permissible level of a contaminant in water that is delivered to the users of a public water supply system. MCL is defined more explicitly in Safe Drinking Water Act regulations (40 CFR Section 141.2).

MGD - Million gallons per day, a commonly used measure of the withdrawal rate of large wells.

Minor Aquifers - Includes a general classification for all other aquifers that do not fall in the major aquifer categories. Primary aquifers in this category include intrusive granitic rocks and related rocks of comparable age of which the Idaho Batholith of central Idaho dominate. Also included are well indurated sedimentary and metamorphic rocks that have been folded, faulted, and intruded by granitic rocks. These rocks tend to crop out in the mountainous regions and may include younger sedimentary rocks (Whitehead & Parliman, October 1979).

Mixed Volcanic and Sedimentary Rocks; Primarily Sedimentary Rocks - Includes the Idaho Group rocks commonly found in the deeper (>100-200 feet) wells of the Boise Valley. The Idaho Group rocks are characterized by unconsolidated to poorly consolidated clay, silt, sand, volcanic ash, diatomite, fresh water limestone and conglomerate. Basalt interbeds occur in some areas. The Idaho Group sediments are overlain by unconsolidated silts, sands and gravels (typically called Terrace Gravel deposits). Thicknesses may reach 5000 feet near the Idaho-Oregon state line.

Mixed Volcanic and Sedimentary Rocks; Primarily Volcanic Rocks - Includes the Bruneau, Banbury and Glenns Ferry Formations. The Bruneau and Banbury Formations are characterized by thick basalt flows, commonly interbedded with thin, fine grained sedimentary layers. Total basalt thickness exceeds 1000 feet in some localities.

The Glenns Ferry Formation is characterized by poorly consolidated detrital material and minor flows of olivine basalt. Silt, clay, and sand beds are common. Total thickness is about 2000 feet.

Monitoring Waiver - A temporary reduction in sampling requirements for a particular contaminant. Even after a waiver is received, some monitoring at a reduced frequency will usually be required. Waivers must be applied for and granted in writing.

Nonpoint Source - A potential source of contamination having diffuse or multiple discharges of contaminants that are spread over a large area.

Perched Ground Water - Unconfined ground water separated from an underlying main body of ground water by an unsaturated zone.

Percolation - Downward movement of water through the unsaturated zone; also defined as the downward flow of water in saturated or nearly saturated porous media at hydraulic gradients of 1.0 or less. The act of water seeping or filtering through the soil without a definite channel.

Permeability - Ability of a porous medium to transmit fluids under a hydraulic gradient. The property or capacity of a porous rock, sediment, or soil for transmitting a fluid; it is a measure of the relative ease of fluid flow under unequal pressure.

Point Source - A potential source of ground water contamination which is individually identifiable in terms of release and zone of impact in the aquifer.

Porosity or Total Porosity (n) - The volume of void spaces in rock or sediment divided by the total volume of the porous medium. Porosity is usually expressed as a decimal fraction or a percent.

Potable Water - Suitable for human consumption as drinking water.

Potentiometric Surface - A surface that represents the level to which water would rise in tightly cased wells. If the head varies significantly with depth in the aquifer, then there may be more than one potentiometric surface. The water table is equal to the potentiometric surface for an unconfined aquifer.

Public Water Supply System - System for provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily for at least 60 days out of the year. The term includes any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with the system, and any collection or pretreatment storage facilities not under such control that are used primarily in connection with the system.

Radius of Influence - The radial distance from the center of a well bore to the point where there is no lowering of the water table or potentiometric surface (the edge of its cone of depression).

Rathdrum Prairie Aquifer - Includes glaciofluvial deposits that extend from Lake Pend Oreille to the Idaho-Washington border. The deposits include fine to coarse sands and gravels and are relatively free of fine-grained materials except near land surface. The saturated thickness of the aquifer is about 280 feet near the state border. The aquifer is thought to overlie the fine grained, semi-consolidated sediments of the Latah Formation (Graham & Campbell, August 1981).

Recharge (r) - The addition of water to the zone of saturation; also, the amount of water added. Can be expressed as a rate (i.e., in/yr) or a volume.

Recharge Area - An area in which water infiltrates into the soil or geological formation from sources such as precipitation, irrigation practices and seepage from creeks, streams or lakes, and percolates to one or more aquifers.

Recharge Boundary - An aquifer system boundary that adds water to the aquifer. Streams and lakes are typical recharge boundaries.

Saturated Zone - Portion of the subsurface environment in which all voids are ideally filled with water under pressure greater than atmospheric. The water table is the top of the saturated zone in an unconfined aquifer. It is also called the phreatic zone.

Semiconfined Aquifer - An aquifer that has a leaky confining unit and displays characteristics of a confined aquifer.

Specific Storage - The volume of water that a unit volume of aquifer releases from storage under a unit decline in hydraulic head.

Specific Yield - The ratio of the volume of water that a given mass of saturated rock or soil will yield by gravity drainage to the volume of that mass. This ratio is stated as a percentage.

Spring - Discrete discharge area where ground water flows naturally from rock or soil onto the land surface or into a surface-water body.

Static Water Level - The level of water in a well.

Storativity (S) - A dimensionless term representing the volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head. It is equal to the product of specific storage and aquifer thickness. In an

unconfined aquifer, the storativity is equivalent to the specific yield. Also called storage coefficient.

Time of Travel (TOT) - The time required for a contaminant to move in the saturated zone from a specific point to a well.

Transmissivity (T) - Rate at which water of the prevailing kinematic viscosity is transmitted through a unit width of the aquifer under a unit hydraulic gradient. It is equal to an integration of the hydraulic conductivities across the saturated part of the aquifer perpendicular to the flow paths and is therefore the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. Transmissivity values are given in gallons per day through a vertical section of an aquifer 1 foot wide and extending the full saturated height of an aquifer under a hydraulic gradient of one in the English Engineering system; in the Standard International System, transmissivity is given in cubic meters per day through a vertical section of an aquifer 1 meter wide and extending the full saturated height of an aquifer under a hydraulic gradient of one. It is a function of properties of the liquid, the porous media and the thickness of the porous media.

Unconfined Aquifer - An aquifer in which there is no confining bed between the zone of saturation and the land surface. The upper surface of the saturated water body is called the water table, where the water pressure is atmospheric.

Unconsolidated Alluvium - Includes alluvium, glacial outwash, talus, terrace gravel, and lake bed and windblown deposits. The deposits include clay, silt, sand, gravel, and boulders which may be loose to well compacted, unbedded to well bedded. Sandy and gravelly alluvium is an important aquifer whereas lake bed sediments yield low amounts of water. Terrace gravel deposits can yield moderate to large amounts of water but in many areas the deposits occur above the water table (Whitehead & Parliman, October 1979).

Unconsolidated Aquifer - An aquifer made up of loose material, such as sand or gravel.

Unsaturated Flow - Movement of water in a porous medium in which the pore spaces are not filled with water.

Unsaturated Zone - Zone or layer of earth in which not all of the interconnected pore spaces of rock or soil are filled with water. The pore spaces will contain some water, as well as air and other gases. This is also known as the vadose zone.

Vadose Zone - See unsaturated zone.

Water Table - The surface on which the fluid pressure in the pores of a porous medium is exactly atmospheric. The upper surface of an unconfined aquifer.

Wellfield - An area containing two or more wells with overlapping zones of contribution that supply a public water supply system.

Wellhead - The physical structure, facility, or device at the land surface from or through which ground water flows or is pumped from subsurface water-bearing formations.

Wellhead Protection Area (WHPA) - The surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield.

Well Yield - The rate of discharge of water from a well, measured in gallons per minute or cubic meters per day.

WHPA - See Wellhead Protection Area.

Zone of Contribution (ZOC) - The area surrounding a pumping well that encompasses all areas or features that supply ground-water recharge to the well.

Zone of Influence (ZOI) - The area surrounding a pumping well within which the water table or potentiometric surfaces have been changed due to ground-water withdrawal.

Zone of Transport (ZOT) - The area surrounding a pumping well through which a contaminant may travel and reach the well.